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A UNIFORM BLANK OF MEASUREMENTS TO BE USED IN RECRUITING. A PLEA FOR THE STANDARDIZATION OF ANTHROPOLOGICAL METHODS[1]

By FABIO FRASSETTO

AMONG the many problems which for some time past await a satisfactory solution, there is one which demands, and I believe fully deserves, your earnest attention and coöperation. It is the problem of the standardization of anthropological measurements, which includes also that of the method of expressing the measurements numerically; a problem which may to some appear insignificant, but which really is of high scientific and practical value.

It is well known to all of you that standardization of anthropometric measurements is urgently needed, and that, at the International Congresses of Monaco in 1906, and Geneva in September of 1912, a satisfactory agreement for craniometry and cephalometry and anthropometry was reached. But it must also be recognized that for the measurements of some parts of the body, an agreement in practice is yet to be attained. We see, in fact, that for the thorax, for the pelvis, and for the other parts of the skeleton, the measurements vary, as much for the number as for the points of reference which distinguish them one from another, and for the manner in which they are made.

For the thorax, for instance, some authors take only two diameters, others four, others six; and in regard to the antero-posterior diameter, it is taken at the level of the nipples or at the level of the fourth rib, or at the level of the jugulum, not at the level of the basis or apex of the xiphoid cartilage, making the measurement

[1] This paper was read before Section H of the American Association for the Advancement of Science at the Baltimore Meeting, 1918, by Prof. Fabio Frassetto, Professor of Anthropology, University of Bologna, Italy, Temporary Attaché, Royal Italian Embassy.

sometimes with the compass held horizontally, sometimes with the same held obliquely.

Furthermore, in the measurements upon the living subject, the inaccuracies in technique and in the instruments used is added to the defects already indicated for skeletometry.

Thus, for instance, in making the measurements of the biacromial diameter, which all anthropologists advise, errors are made, varying from 10 to 30 millimeters; errors which, given the shortness of the distance to be measured, are not admissible, so much so that that they moved Parson, who recently studied this measurement, not to use it any longer, and to substitute a measurement taken at the upper part of the deltoid muscles.[1]

These and other uncertainties which we regret in the field of scientific anthropometry and which are rather serious, become even more so and more numerous when we examine the technique followed in the fields of applied anthropometry and in other kindred fields by persons not sufficiently dexterous in anthropometrical technique. We find, then, that the obstetrician measures one just born in a fixed way and with fixed instruments, which are not exactly the same as those used by the anthropologist. We find that at one's puberty the hygienist does not conform entirely to the data of a rigorous anthropometry; and that the military surgeon does the same, when one presents himself for the duties of the draft; to say nothing of the clinical doctor, who wishes to discover, through the anomalous proportions of the parts of the body, the reasons for a diseased state. And let us not speak of anthropometry practised upon the living subject for artistic purpose, nor of that practised upon the cadaver by the anatomist.

Now, having in mind the fact that one of the indispensable phases through which the scientific method must develop is precisely *comparison* (by means of which are known, enumerated, and also valued quantitatively and qualitatively resemblances and differences among objects) and that one of the principal aims of *external anthropometry* (setting aside *internal and intermediate*

[1] Parson (F. G.), Biacromial Breadth—On the Proportion and Characteristics of the Modern English Clavicle. *Journal of Anatomy*, London, 1910, li, 71–93.

anthropometry) is that of establishing the proportions among the various parts of the body in the different ages of individuals so as to utilize them not only for their racial but also for the diagnosis of their individual constitution; having all this in mind, many comments are not needed to demonstrate the impossibility of using seriously all the measurements gathered by such different persons with such a diversity of technique and of instruments. And then, why persist in this false way if it does not lead to any useful result? Why waste so much time and money to arrive at nothing; and still worse, to spread, under the false appearance of scientific truths, serious errors and false concepts, to the damage of science itself and of society?

From such a deplorable state of things results the greatest urgency to face and to solve the problem of the revision and of the standardization of anthropometric measurements; the more so, since the solution of this problem is strongly urged everywhere, and especially in the United States, in England, and in Italy; in which nations there has recently been manifested a certain anthropological activity in connection with the war, as much in the studies for the physical well-being of soldiers, as in purely scientific studies. Now, the results of such studies and of other eventual studies which might be made, would be in themselves not very fruitful, could they not be compared with one another; and since, speaking scientifically or socially, as you will, such comparisons are indispensable, there can be no doubt whatever as to the necessity of instituting a uniform blank of measurements to be used in recruiting. But to attain this useful end, there is imposed from the beginning the necessity of a perfect accord upon the method of numerical valuation for anthropological measurements; that is to say, the solution of the first of the two problems mentioned.

It is well known that scientific measurements are expressed by means of two principal systems: the *metric system* and the *English system*. It is further known that while the first has for some time been used in all the nations of the world, the second is still generally used—but not by all—in England, in the United States of America, and in Canada. Nevertheless, it must be remembered that in the

war, just closed, in England, and especially in the United States, very great progress has been made toward the general adoption of the metric system, towards which end will have contributed not a little the decision taken by the War Department General Order for adopting the metric decimal system in all operations of the war of the American Army fighting in Europe.

WAR DEPARTMENT,
WASHINGTON, January, 1918.

The metric system has been adopted for use in France for all firing data for artillery and machine guns, in the preparation of operation orders and in map construction. Artillery and machine gun material intended for service abroad is being graduated accordingly. Instruction in the metric system will be given all concerned. The sights of the infantry rifle and the automatic rifle will be left unchanged.

(003.11, A.G.O.)

By order of the Secretary of War.
TASKER H. BLISS,
General, Chief of Staff.

OFFICIAL
H. P. MCCAIN,
The Adjutant General.

This wise decision of the War Department is for all of us an encouragement and a spur to the hope that in the fruitful works of peace there may be attained the desired agreement upon the adoption of the metric system in making measurements for the recruiting in American and English armies and in all anthropological researches. Especially so, if the proper offices of the American and English Departments of War and Navy will continue the work already very successfully started during the war for all the operations of the war, and if all those American and English colleagues who may not as yet have followed in their anthropological researches the above-mentioned system, used, in fact, already for some time by not a few of their compatriots, will also do the same. The question therefore of the desired institution of a uniform blank for measurements to be used in recruiting is based on the solution of this first problem.

Assuming that an agreement has been reached upon the problem of which we have just spoken, let us now pass to that more general

one in regard to the standardization of anthropological methods. The necessity of coming to an agreement upon this most important and fundamental problem has been explicitly manifested on several occasions, especially for that part which concerns the anthropometric technique and nomenclature in general; and we ourselves have treated this in the accounts of the *Anthropological Atlas of Italy* made in 1909 and 1910 on the occasion of the third and fourth reunion of the Italian Society for the Progress of Science, and also at the International Anthropological Congress held at Geneva in 1912 and on still other occasions.[1]

Today when anthropological researches are being greatly developed and accomplished with rigor of procedure, and are developing largely in the field of practical application, the necessity of a standardization of anthropological methods is more keenly felt. For this reason we hold it to be opportune to call the attention of the anthropologists and of the psychologists here assembled to this question of fundamental importance, so that from now on may begin those studies which should lead in the best way and in the least time to the attainment of our object. Since, however, the study which we propose to undertake is a study of preparation, it cannot result in definite perfection; and, with the progress of our science, adjustments and additions will have to be made afterwards, in order to obtain a methodology always more perfect and always more in accord with the perfecting of instruments and with the new facts, which from time to time will be discovered, correcting or confirming, as is the custom to do in the most progressive scientific methodologies.

But since such a task appears very complex and full of difficulties, a wise counsel will be the institution of a permanent International Executive Committee, in which may be duly represented the schools fitted to give rigorous and at the same time also practical direction to our science.

Practical steps towards the formation of such a committee have already been taken at and after the reunion of the 18th International

[1] See F. Frassetto, *Lezioni di Antropologia*, Seconda Edizione, Milano, Hoepli, 1918, and particularly *Atti. Soc. Ital. Progresso Scienze* vol. 3, 1909, and vol. 4, 1910.

Congress of Americanists at London in 1912, on which occasion an International Committee of Anthropologists was established with Professor Marett, of Oxford, as Secretary.[1] The work of the committee was interrupted by the war.

Such a committee should superintend the careful unfolding of the whole program of work; that is to say, it should gather and coördinate the various ideas and propositions both its own and those which would be formulated by the various anthropologists into a blank which should express in the best possible way the logical systematization of anthropological methodology according to the actual state of our knowledge, anthropological as well as scientific in general. This grave task might be facilitated and simplified, should subdivision of the work be attained in such a way that each of the single members of the aforesaid committee might give his contribution to those arguments in which his own competence and aptitude in treating them were recognized. I leave, however, to the initiative of the committee which will be nominated the establishment of the manner of organizing the above-mentioned subdivision of the work and I bring my appeal to an end, expounding briefly in a decalogue in which are shown the fundamental criteria which, according to our judgment, should serve as guides for the unification of anthropological methods.

Such a decalogue, the ample and complete development of which I shall give presently, is the following:

I. Anthropological researches should have a double purpose,—scientific and practical.

II. The method to be adopted should be the inductive method, this should be metric and descriptive and should include the study of the internal organs and the organs of sense.

III. Work should be done, in so far as possible, upon well-determined and sufficiently numerous material.

IV. The selection of measures and of points of reference, should be based upon morphological and physiological criteria.

V. The system for expressing anthropological measurements should be the metric decimal system.

[1] *Proc. XVIII, Internat. Cong. Amer.* London, 1912, vol. I, LXXXVI.

VI. Anthropological measurements should be taken with a properly selected set of instruments and according to uniform methods; they should always be expressed in centimeters, and in the case of measurements between symmetrical points these should always be determined by working from the left side. A minimum amount of admissible error shall be determined for each measurement.

VII. Anthropological nomenclature in general, as also that for measurements, should be scientific, simple, and should be expressed always in the Latin language. It is to be recommended that non-specialists use also their own language.

VIII. The original measurements should always be set down in full, and should be elaborated according to strict statistical methods. The selection of indices and of the categories into which they may be grouped should be made, in so far as possible, on the basis of comparative morphologic and morphometric criteria.

IX. All graphic reproductions (photographs, designs, etc.) should always have the same orientation for the same parts of the body; they should not be under a size to be determined by subsequent agreement, and in so far as possible, there should be a wider use than now prevails of radiography, of chromophotography, and of stereoscopic photography.

X. The synthesis of numerical and morphological data should be made according to the method of diagrams and maps; and the grouping of anthropological units as well as their geographical distribution should be made according to the principles of *varieties*, *species*, *genera* . . . , as is the custom in zoölogy and in botany.

Having thus arrived at the end of our communication and returning to the theme with which we started—that of the institution of a uniform blank of measurements for recruiting—we formulate the wish that the proposition which we made today in this memorable assembly be received with general favor, to the entire advantage of the progress of science and of social well-being.

ROYAL ITALIAN EMBASSY,
WASHINGTON, D. C.